



UNITED STATES PATENT AND TRADEMARK OFFICE

TP

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/769,030	01/30/2004	Satoshi Oshima	16869S-104700US	7614

20350 7590 08/04/2006

TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER

CAMPOS, YAIMA

ART UNIT	PAPER NUMBER
----------	--------------

2185

DATE MAILED: 08/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/769,030	Applicant(s) OSHIMA ET AL.	
	Examiner Yaima Campos	Art Unit 2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 22 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2185

1. The examiner acknowledges the applicant's submission of the amendment dated May 22, 2006. At this point claims (1, 10-11 and 13-15) have been amended, claim (6) has been cancelled and claim 17 has been added. Thus, claims (1-5 and 7-17) are pending in the instant application.

I. OBJECTIONS TO THE SPECIFICATION

Claim Objections

1. Claim 8 is objected to because of the following informalities:
2. Claim 8 depends on claim 6, which has been cancelled by Applicant.
Accordingly, applicant might consider changing the dependency of claim 8 from claim 6 to claim 5.
3. Appropriate correction is required.

II. REJECTIONS BASED ON PRIOR ART

4. **Claims 1-2, 9-10, 12-13 and 16-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takaichi (US 2003/0018849) in view of Omura et al. (US 5,687,347).
5. As per **claims 1-2, 10, 12-13 and 17**, Takaichi discloses
“A storage device/read-ahead method having a capability of learning access patterns, comprising:” [“**the present invention relates to a disk memory device for reading data recorded on a disk memory medium such as a magnetic disk, an optical disk, or the like, and, more particularly, to a data prereading method of the disk memory device**” (Page 1, Paragraph 0001) and further teaches that “the continuity

detection unit 4 calculates an access direction along which data prereading is to be carried out, by employing the history of read commands” (Page 3, Paragraph 0047) as analyzing patterns of access to a storage device]

“a control unit/management computer;” [With respect to this limitation, Takaichi discloses “cache hits judgment unit 3,” “continuity detection unit 4,” “prereading area decision unit 6” and “prereading startup unit 7;” all within CPU 101 (Figure 1)]

“a cache memory;” [Takaichi discloses this limitation as “the cache memory 10 holds the preread data” (Page 4, Paragraph 0052)]

“and a disk device;” [With respect to this limitation, Takaichi discloses that “a host device 1 outputs a read command for reading data recorded in a disk memory medium, to the disk memory device” (Page 3, Paragraph 0044, lines 4-6)]

“wherein said control unit records a data readout location the disk device as a history for each computer,” [Takaichi discloses this limitation as “a command history information storage means for holding historic information of read commands as information for reading data recorded on a disk memory medium, which read commands are received from a host device” (Figure 1 and Page 1, Paragraph 0012, lines 2-6)]

“respectively reading out data from said storage device, based on predetermined information,” [With respect to this limitation, Takaichi discloses “reading of a data block, which follows a data block for which a reading request has been made, is

started and the read data are stored in a cache memory before a next reading request is received” (Page 1, Paragraph 2, lines 4-7)]

“and then pre-reads data to be used by a computer from said disk device to said cache memory,” **[With respect to this limitation, Takaichi discloses that “the prereading startup unit 7 instructs the disk transfer unit 8 to read out data in the data area to be preread, which is decided by the prereading area decision unit 6, from the disk memory medium, and store the read data in the cache memory 10” (Page 4, Paragraph 0050)]**

“based on a command containing information for specifying” one computer, “said pre-read data being determined in accordance with said history of data readout activity of said one computer” **[With respect to this information, Takaichi discloses that “the continuity detection unit, which has received a read command from the host device through the host I/F unit, performs a continuity detection process” based on the position of the data which has been requested by the last read command and recorded in the read command history table as a command history information storage means” (Page 6, Paragraph 0101, lines 3-9) as having information for specifying access history within an access command].** Takaichi also discloses having a **[“host device 1,” a “host I/F unit 2,” and a “host transfer unit 11” which send and process read commands to a disk drive which are stored on “command history table 5” as providing information for a host/client computer for each command].** Takaichi further discloses having “a second command” for accessing data in a disk as **[“that prereading of data can be effectively performed**

even when the disk memory device receives continuous read commands requesting data which are located separately at equal intervals” (Page 6, Paragraph 93)].

Takaichi does not disclose expressly having a “plurality of computers” accessing data in a disk nor “information for specifying said computer that uses said storage device.”

Omura discloses “having a plurality of computers” access data in a disk and keeping “information for specifying said computer that uses said storage device” as it is disclosed that **[“the present invention relates to a data providing device and a file server device” using a “data transfer control method for prefetching data from a storage device” (Column 1, lines 8-9 and 12-13). Omura further explains having a “request input section for receiving data request commands, sent over a network from a plurality of data request sections of a plurality of data request devices” and also discloses “a request-command storing section for storing the data request commands received by the request input section by grouping the request commands for each data request section of each data request device” (Column 4, lines 31-39)].**

Takaichi (US 2003/0018849) and Omura et al. (US 5,687,347) are analogous art because they are form the same field of endeavor of accessing memory and prefetching/prereading data likely to be accessed.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine Takaichi (US 2003/0018849) with Omura et al. (US 5,687,347)

and make the data to a data prereading method of a disk device, which prereads data based on host access history as taught by Takaichi, further include the ability of taking "information for specifying said computer that uses said storage device" into account when more than one host device/computer is used for data pre-fetching, as disclosed by Omura. Furthermore, when prefetching is done for a plurality of computers, as taught by Omura, necessary information for doing this prefetching must be maintained for each of the plurality of computers.

The motivation for doing so would have been because Omura teaches that [**"the file server device of the invention has the advantage that the number of terminals that can be attached can be further increased compared to the prior art device"** (Column 5, lines 37-39). Omura also teaches that identifying a "requesting device" aids in determining whether a certain device was "previously requested by that terminal" (Column 5, line 43) so that "prefetching can be performed with well-balance for a plurality of terminals, that data can be transmitted at equal rates, and that the speed of processing can be improved" (Column 6, lines 7-9)].

Therefore, it would have been obvious to combine Omura et al. (US 5,687,347) with Takaichi (US 2003/0018849) for the benefit of creating a data storage prereading sytem/method to obtain the invention as specified in claims 1-2, 10, 12-13 and 17.

6. As per **claim 9**, the combination of Takaichi and "A storage device according to claim 1," [**See rejection to claim 1 above**] "wherein the history is arranged to be recorded in form of a table specifying a relationship among a history ID, the data readout location" [**With respect to this limitation, Takaichi discloses "the history of**

read commands stored in the read command history table 5 which is a command history information storage means” (Page 3, Paragraph 0047)] “and the computer using the data having been stored in the location” [With respect to this limitation, Omura discloses “a request-command storing section for storing the data request commands received by the request input section by grouping the request commands for each data request section of each data request device” (Column 4, lines 31-39)].

7. As per **claim 11**, the combination of Takaichi and Omura discloses “A system according to claim 9,” **[See rejection to claim 9 above]** “wherein said management computer includes information about schedule of a designation to be transmitted to said storage device by said computer itself, and said management computer transmits said first command or second command to said storage device based on said schedule” **[With respect to this limitation, Takaichi discloses that “prereading of data can be effectively performed even when the disk memory device receives continuous read commands requesting data which are located separately at equal intervals” (Page 6, Paragraph 93) and also discloses “means for holding prereading rules for performing prereading of data” (Page 2, Paragraph 0013) which is equivalent to having scheduling information for prereading data].**

8. As per **claim 16**, the combination of Takaichi and Omura discloses “A system according to claim 10,” **[See rejection to claim 10 above]** “wherein said management computer classifies said plurality of computers into a plurality of groups when registering said computers” **[With respect to this limitation, Omura discloses “a request-**

command storing section for storing the data request commands received by the request input section by grouping the request commands for each data request section of each data request device” (Column 4, lines 31-39)].

9. **Claims 3-5 and 14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takaichi (US 2003/0018849) and Omura et al. (US 5,687,347) as applied to claims 1-2, 6, 9-13 and 16 above, and further in view of Letwin (US 5,257,370).

10. As per **claim 3 and 14-15**, the combination of Takaichi and Omura discloses “A storage device according to claim 2,” [See rejection to claim 2 above] which uses predetermined time intervals for transferring of data[**With respect to this limitation, Omura discloses “a request-command sequencing control section which transfers the data request commands, received form the data request sections and stored in the request-command storing section 104, one at a time to the data generating section 102 at prescribed intervals of time and in the order in which they were received” (Columns 7-8, lines 67 and 1-5) as providing prescribed time limits for transferring/recording of data]** but fail to disclose expressly that “predetermined information includes information on time, and said control unit records said history as being linked with information for specifying said history and information for specifying said computer until a predetermined time”.

Letwin discloses having “predetermined information” which “includes information on time, and said control unit records said history as being linked with information for specifying said history and information for specifying said computer until a

predetermined time” as [“means for caching data in a disk based computer system” which “monitors file access behavior for the file and records the access behavior in the file access log” (Column 2, lines 12-26) wherein “when a read request is received, the range of data read and the access time is monitored” (Column 3, lines 43-45) and also teaches scheduling “a preread to cache data of the disk data based on the access history and at the same time creates a new process to instruct a new process to read the indicated data” (Column 5, lines 9-11). Letwin also discloses that a “range of access and access time are determined from the access log, and based on the range of access and access time, it is determined whether access of the file was sequential and within a predetermined access time” (Abstract)].

Letwin (US 5,257,370), Takaichi (US 2003/0018849) and Omura et al. (US 5,687,347) are analogous art because they are from the same field of endeavor of accessing memory and prefetching/prereading data likely to be accessed.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine Takaichi (US 2003/0018849) with Omura et al. (US 5,687,347) and make the data to a data prereading method of a disk device, which prereads data based on access history as taught by Takaichi, further include the ability of taking information specifying a computer/client accessing data into account when more than one host device/computer is used, as disclosed by Omura and further limit the time for every access to data as taught by Letwin.

The motivation for doing so would have been because Letwin teaches that having a predetermined time for each data access wherein **["a method and means for determining past-access behavior by a time a file is opened; thus eliminating the delay typically required to create a past behavior log" (Column 2, lines 4-8) and also explains that this "improves the speed and performance of a computer system" (Column 2, lines 34-35)]**

Therefore, it would have been obvious to combine Omura et al. (US 5,687,347) with Takaichi (US 2003/0018849) and Letwin (US 5,257,370) for the benefit of creating a data storage prereading system/method to obtain the invention as specified in claims 3 and 14-15.

11. As per **claim 4**, the combination of Takaichi, Omura and Letwin discloses "A storage device according to claim 3," **[See rejection to claim 3 above]** "wherein said predetermined information includes information for specifying a data storage location of said disk device, and said control unit records said history as being linked with said information for specifying said history and said information for specifying said computer from a time when said computer specified by said information for specifying said computer reads out data stored at a data storage location of said specified disk device" **[With respect to this limitation, Takaichi discloses "The prereading area decision unit 6 decides the position and size of a data area on the disk memory medium where prereading is to be carried out, on the basis of the read command, the result of the detection by the continuity detection unit 4, and the access area**

information stored in the access area information storage unit 13” (Page 4, Paragraph 0049) as specifying a disk location from which data is to be read].

12. As per **claim 5**, the combination of Takaichi, Omura and Letwin discloses “A storage device according to claim 4,” **[See rejection to claim 4 above]** “wherein when a command of stopping record of said history is received, the record of said history is stopped” **[With respect to this limitation, Letwin discloses that “when a read request is received, the range of data read and access time is monitored. Each access is recorded until the read operation is completed and detected” (Column 3, lines 43-46) as accessing data within a predetermined amount of time and having “detecting” means to detect when a data access takes more time than a predetermined amount of time. Letwin also discloses blocking “further operation until the read operation is complete” (Column 5, lines 32-33) as equivalent to having a stop command to stop recording data]**

13. **Claim 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takaichi (US 2003/0018849), Omura et al. (US 5,687,347) and Letwin (US 5,257,370) as applied to claim 1-6 and 9-16 above, and further in view of Kedem et al. (US 2003/0037202).

14. As per **claims 7 and 8**, the combination of Takaichi and Omura discloses “A storage device according to claim 4,” **[See rejection to claim 4 above]** but fails to disclose expressly that “an operating system program to be used by said specified computer is stored in a location specified by the information for specifying the data storage location of said disk device”.

Kedem discloses “an operating system program to be used by said specified computer is stored in a location specified by the information for specifying the data storage location of said disk device” as [**“The present invention is generally related to persistent storage devices, and, more specifically, to a system and method for enabling the centralized storage and maintenance of persistent storage device data images” (Page 1, Paragraph 0003) and also teaches that “DIMS is capable of updating the cached data image at its convenience, that is in a pull rather than a push mode, the DIMS allows all of a computer’s software (operating system, software applications, and other data) to be installed and maintained at a remote site” (Page 8, Paragraph 0110).**]

Takaichi (US 2003/0018849), Letwin (US 5,257,370), Omura et al. (US 5,687,347) and Kedem et al. (US 2003/0037202) are analogous art because they are form the same field of endeavor of memory accessing.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine Takaichi (US 2003/0018849), Omura et al. (US 5,687,347) and Kedem et al. (US 2003/0037202) to make the data prereading method of a disk device, which prereads data based on access history as taught by Takaichi, further include the ability of taking information specifying each host/client/requesting computer into account when more than one host computer is used, as disclosed by Omura and further make “the data” that is to be accessed/preread be data dealing with a computer’s software such as operating system, software applications and other data as specified by Kedem.

The motivation for doing so would have been because Kedem teaches that having a computer's software such as operating system, software application and other data stored at remote locations [**"gives users unprecedented benefit as it requires no support form the local operating system or application software"** (Page 8, Paragraph 0110) and also explains that **"because the physical data image is store remotely, operating systems, applications and other data may be updated on the remote persistent storage device(s) by Information Technology (IT) professionals (through high-level interfaces such as NTFS)"** (Page 8, Paragraph 0110)].

Therefore, it would have been obvious to combine Kedem et al. (US 2003/0037202) with Omura et al. (US 5,687,347) and Takaichi (US 2003/0018849) for the benefit of creating a data storage prereading sytem/method to obtain the invention as specified in claims 7 and 8.

III. ACKNOWLEDGMENT OF ISSUES RAISED BY THE APPLICANT

Response to Amendment

2. Applicant's arguments filed on May 22, 2006 have been fully considered but they are not deemed to be persuasive and, as required by **M.P.E.P. § 707.07(f)**, a response to these arguments appears below.

IV. ARGUMENTS CONCERNING PRIOR ART REJECTIONS

1st POINT OF ARGUMENT:

3. Regarding Applicant's remark that Takaichi does not disclose "said pre-read data being determined in accordance with said history of data readout activity," it is the

Examiner's position that due to breath of the claim language, Takaichi's disclosure meets all of the limitations required by the claims.

4. Applicant asserts that Takaichi discloses prereading data based on positional parameters and not on the data itself; however, it is the Examiner's position that Takaichi discloses "said pre-read data being determined in accordance with said history of data readout activity," as having **[a "read command history table 5 as a command history information storage means" (Figure 1; Figure 5; Page 3, Paragraph 0045; Pages 4-5, Paragraphs 0068-0072; See claim rejections above) which is used for "holding historic information of read commands for information for reading data recorded on a disk memory medium, which read commands are received from a host device; a continuity detections means for detecting an area-to-area distance which is an interval of data to be preread, on the basis of the read commands stored in the command history information storage means" (Page 2, Paragraph 0013)]**. Applicant should note that Takaichi's disclosed "historic information of read commands" which is used to determine what areas of memory to preread, comprises "data readout activity" as claimed by Applicant. Furthermore, as Takaichi's "continuity detections means for detecting an area-to-area distance which is an interval of data to be preread," comprise detecting "data" to preread, as claimed by Applicant.

2ND POINT OF ARGUMENT:

5. Regarding Applicant's remark that Omura does not disclose "pre-reads, data to be used by said one of said computers..., said pre-read data being determined in accordance with said history of data readout activity of said one of said computer," the

examiner directs Applicant's attention to 103, obviousness type rejection [**See rejection to claims above**] wherein Examiner establishes that it would have been obvious to combine Takaichi (US 2003/0018849), with Omura et al. (US 5,687,347), to meet the limitations of the claimed invention.

6. All arguments by the applicant are believed to be covered in the body of the office action or in the above remarks and thus, this action constitutes a complete response to the issues raised in the remarks dated May 22, 2006.

V. CITATION OF RELEVANT ART

7. The references to Takaichi (US 2003/0018849), Omura et al. (US 5,687,347), Letwin (US 5,257,370) and Kedem et al. (US 2003/0037202) were not correctly cited in the last Office action. The correct citation is shown on the attached PTO-892.

VI. CLOSING COMMENTS

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

9. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

Art Unit: 2185

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

VII. STATUS OF CLAIMS IN THE APPLICATION

10. The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. § 707.07(i)**:

CLAIMS NO LONGER IN THE APPLICATION

11. Claim 6 was cancelled by the amendment dated May 22, 2006.

CLAIMS REJECTED IN THE APPLICATION

12. Per the instant office action, claims **1-5 and 7-17** hve received a second action on the merits and are subject of a final rejection.

13. For at least the above reasons it is the examiner's position that the applicant's claims are not in condition for allowance.

VIII. DIRECTION OF FUTURE CORRESPONDENCES

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaima Campos whose telephone number is (571) 272-

Art Unit: 2185

1232 and email address is Yaima.Campos@uspto.gov. The examiner can normally be reached on Monday to Friday 8:30 AM to 5:00 PM.

IMPORTANT NOTE

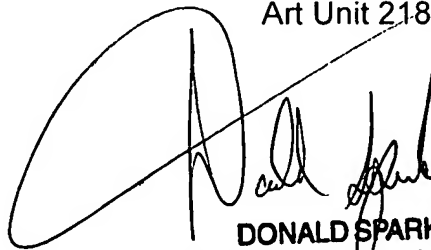
15. If attempts to reach the above noted Examiner by telephone or email are unsuccessful, the Examiner's supervisor, Mr. Donald Sparks, can be reached at the following telephone number: Area Code (571) 272-4201.

16. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

July 31, 2006



Yaima Campos
Examiner
Art Unit 2185



DONALD SPARKS
SUPERVISORY PATENT EXAMINER